Chapter 2.4 Bear River Watershed Management Unit

2.4.1 Introduction

The Bear River Basin is part of the Great Basin Hydrologic region, and is comprised of the U.S.G.S. Hydrological Units (HUCs) listed in Table 2.4-1. The Bear River is the principal stream within this drainage area. It flows north out of Utah into Wyoming, then back into Utah, returns to Wyoming, then crosses into Idaho, then flows southwest into Utah and empties into the Great Salt Lake. The Bear River is the longest river (approximately 500 miles long) in the United States whose waters do not eventually empty into an ocean. Originally the Bear River did not flow into Bear Lake, but since the early 1900's, it has been diverted into Bear Lake at Stewart Dam. Water flows from Bear Lake into the Bear River via a canal. Other streams of interest include the Logan, Blacksmith Fork, Cub River and the Little Bear Rivers.

Table 2.4-1 U.S.G.S. Hydrological Units in the Bear River Watershed Management Unit

Hydrological Unit Code	Hydrological Unit Name
16010101	Upper Bear
16010102	Central Bear
16010201	Bear Lake
16010202	Middle Bear
16010203	Little Bear - Logan
16010204	Lower Bear - Malad

2.4.2 Water Quality Assessment Results

Water chemistry and field data collected from January 1, 2002 through December 31, 2006 were used to make assessments. Benthic macroinvertebrate data were collected at several monitoring sites (Chapter 2.15) were used to assess aquatic life beneficial uses under the State's narrative standard. Water quality data were compared against standards established for each of the designated beneficial uses that can be assigned to rivers and streams within the state to determine beneficial use support. The designated beneficial use classes assigned to rivers and streams in the Bear River Watershed Management Unit are mapped in Figure 2.4-1.

2.4.1.1 Overall Beneficial Use Support

An assessment of beneficial use support was made for 1,043.2 miles. Based upon at least one beneficial use being assessed, 741.71 miles (71.1%) were assessed as fully supporting and 28.9% as not supporting (Figure 2.4-2).

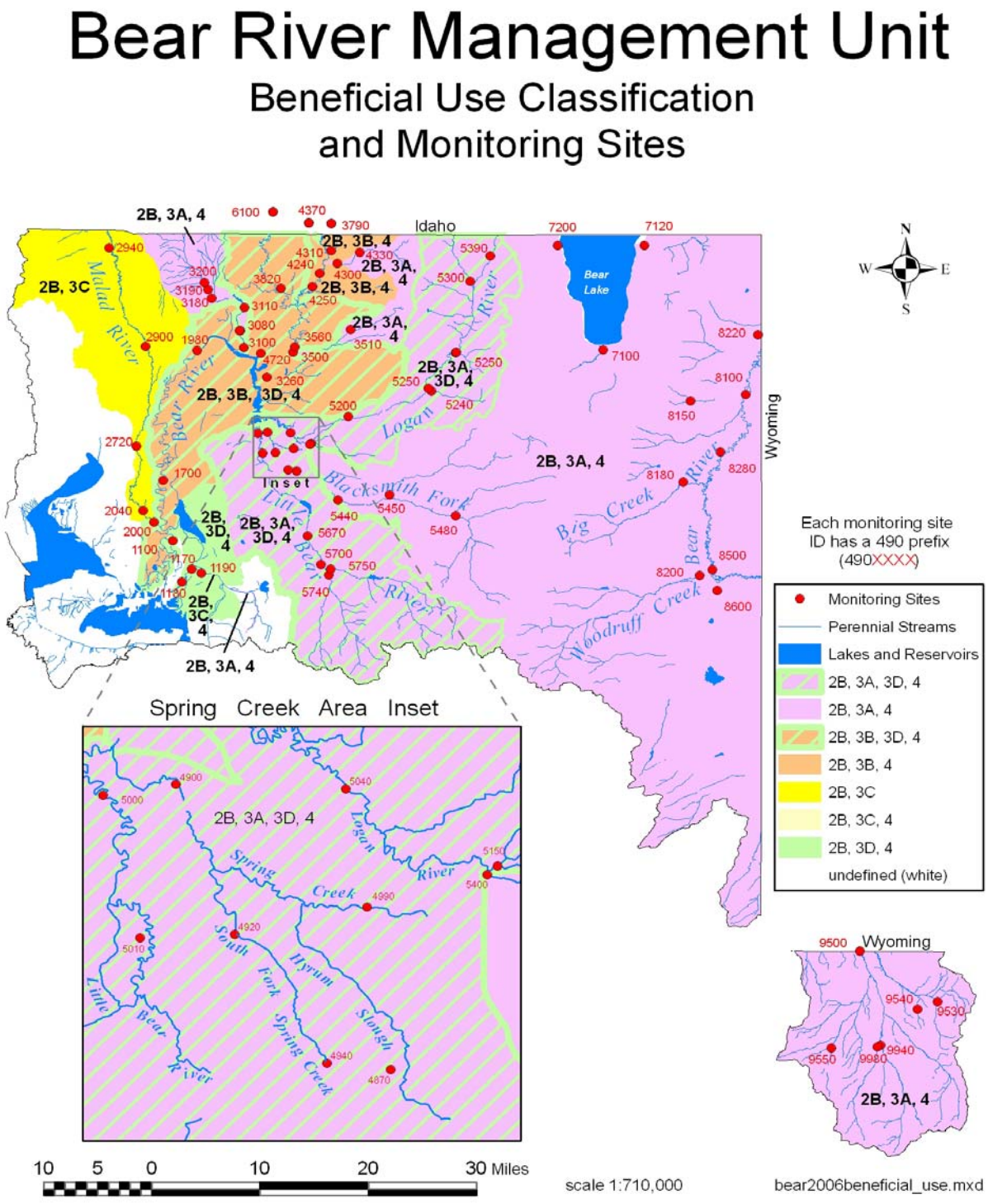

Figure 2.4-1 River and stream beneficial use classes – Bear River Watershed Management Unit

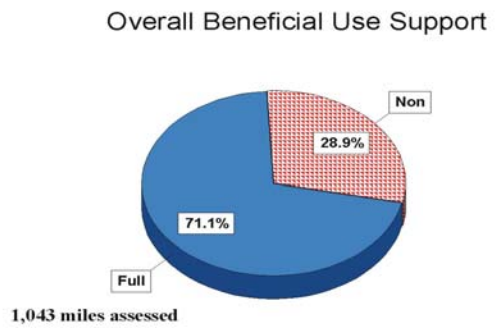

Figure 2.4-2 Overall Beneficial Use Support

2.4.1.2 Assessment by Categories

Table 2.4-2 is a list of streams miles assigned to the various beneficial use categories during the assessment. Figure 2.4-3 is a map of the stream miles that were assessed during this cycle.

Table 2.4-2 Stream Miles by Assessment Category – Bear River Watershed Management Unit

Category	Category Definition	Stream Miles
1	All beneficial uses fully supported.	
2	Beneficial uses assessed are fully supported.	741.71
3A	No data or insufficient data to make an assessment.	178.28
3B	Lakes that are not supported for one cycle only.	
3C	Insufficient data to assess but an assessment plan is in place.	
4A	Approved TMDL	172.46
4B	Pollution control requirements are expected to result in full beneficial use support in near future.	
4C	Impaired by pollution, no TMDL required.	
5	Impaired by pollutant, TMDL required.	176.01

2.4.1.3 Individual Beneficial Use Support

Use support by individual beneficial use designations is summarized in Table 2.4-3. For aquatic life, 910.79 miles were assessed. Of these, 859.08 miles (77.1%), are supporting aquatic life. There are 51.71.0 (28.9%) miles not supporting aquatic life. Of the 910.79 miles assessed for agricultural use, 859.1 miles (94.3%) are fully supporting and 51.7 miles (5.7%) are not supporting this beneficial use. Of the stream miles assessed for swimming and secondary contact recreation (34.2 miles), were not supporting this beneficial use. They were impaired by pH and pathogens.

Table 2.4-3 Individual Use Support Summary – Bear River Watershed Management Unit

	Size Assessed	Size Fully Supporting	Size Not Supporting	Totals
Use				
Drinking Water				
Fish Consumption	0	0	0	0
Swimming	34.2	0	34.2	34.2
Secondary Contact	34.2	0	34.2	34.2
Aquatic Life	1,043.6	741.47	301.96	1,043.67
Agricultural	910.79	859.08	51.71	910.79
Drinking Water				
Fish Consumption	0	0	0	0
Swimming		0	100.0%	100.0%
Secondary Contact		0	100.0%	100.0%
Aquatic Life		77.1%	28.9%	100.0%
Agricultural		94.3%	5.7%	100.0%

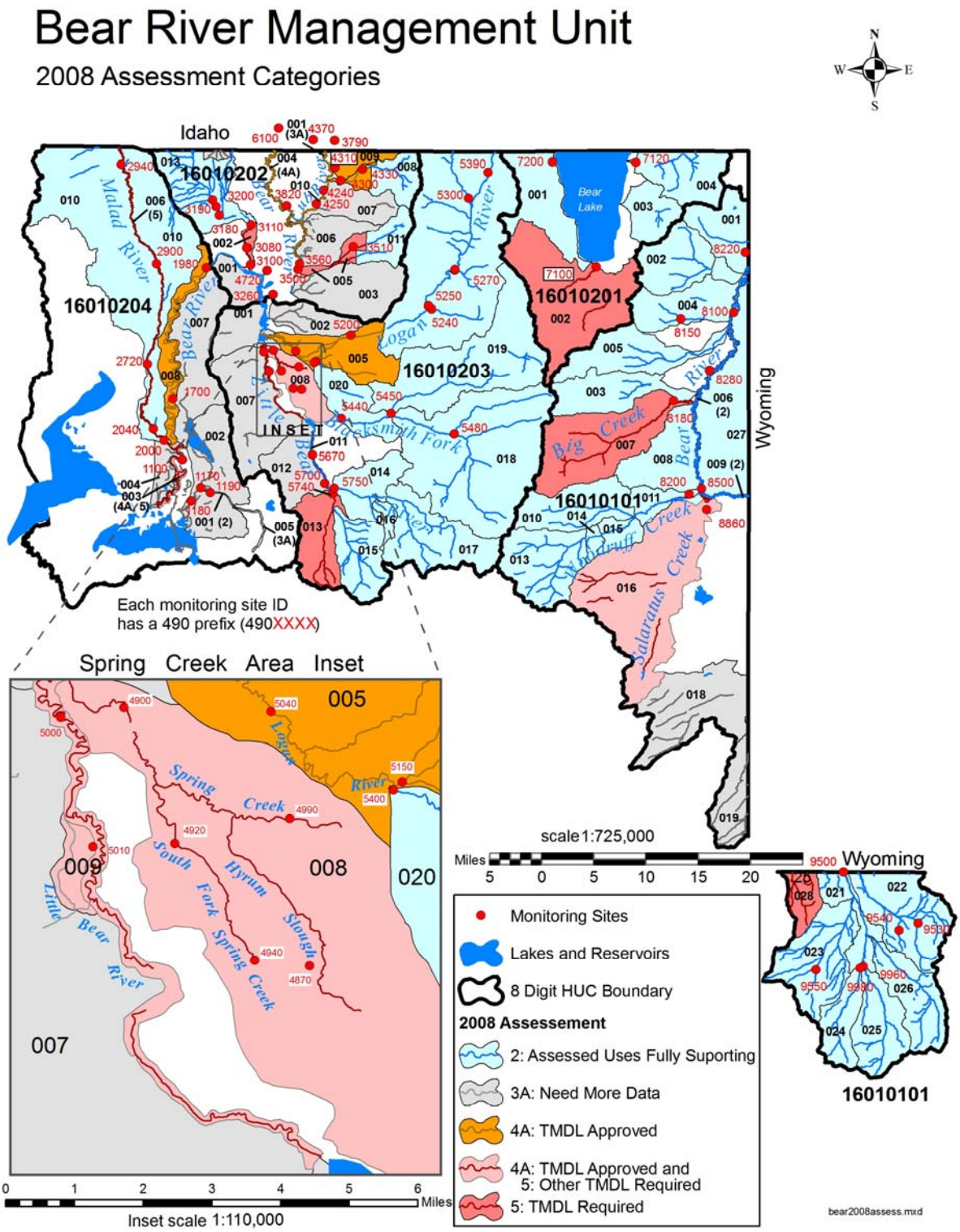

Figure 2.4-3 River and stream designated beneficial uses – Bear River Watershed Management Unit

2.4.1.4 Total l Waters Impaired by Various Causes

Table 2.4-4 is a list of the stream miles affected by the various causes categories identified as generally affecting water quality in the Bear River Watershed Management Unit. The major cause of water quality impairment is total phosphorus, a nutrient (Figure 2.4-4). Other factors affecting beneficial uses are temperature, total dissolved solids, and pH. Unknown causes affect 51.96 stream miles. The relative percent impact by causes is shown in Figure 2.4-5.

2.4.1.5 Total Waters Impaired by Various Sources

Table 2.4-5 is a list of the stream miles affected by various source categories. Sources of impairment include agriculture, unknown sources, industrial point sources, municipal point sources, natural sources, urban runoff, hydromodification and habitat modification. The percent of the stream miles affected by sources is illustrated in Figure 2.4-6. The relative percent impacts by sources are illustrated in Figure 2.4-7.

2.4.1.6 Impaired Assessment Units

Table 2.4-6 is a list of the impaired waters in the Bear River Watershed Management Unit.

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Table 2.4-4 Total Waters Impaired by Various Cause Categories (Stream Miles) - Bear River Watershed Management Unit	
Cause Category	**Stream Miles**
Benthic Macroinvertebrate Assessment Impairment	68.36
E. coli	7.36
Flow Alteration	
Netals	
Organic Enrichment/Low DO	7.36
Other Habitat Alterations	
pH	26.84
Radiation	
Salinity/TDS/Chlorides	24.87
Siltation	
Temperature	63.34
Total Phosphorus	172.46
Unionized Ammonia	7.36

Table 2.4-4 Total Waters Impaired by Various Cause Categories (Stream Miles) – Bear River Watershed Management Unit

Table 2.4-5 Total Waters Impaired by Various Source Categories (Stream Miles) – Bear River Watershed Management Unit

Table 2.4-5. Total Waters Impaired by Various Source Categories (Stream Miles) – Bear River Watershed Management Unit.	
Source Category	**Stream Miles**
Agriculture	172.46
Aquaculture	
Construction	
Drought	
Habitat Modification (other than Hydromodification)	14.31
Hydromodification	11.96
Industrial Point Sources	66.37
Land Development	
Major Municipal Point Source	
Municipal Point Sources	66.37
Natural Sources	17.51
Resource Extraction	
Septic	
Source Unknown	151.74
Sources outside State Jurisdiction or Borders	
Urban Runoff/Storm Sewers	36.2

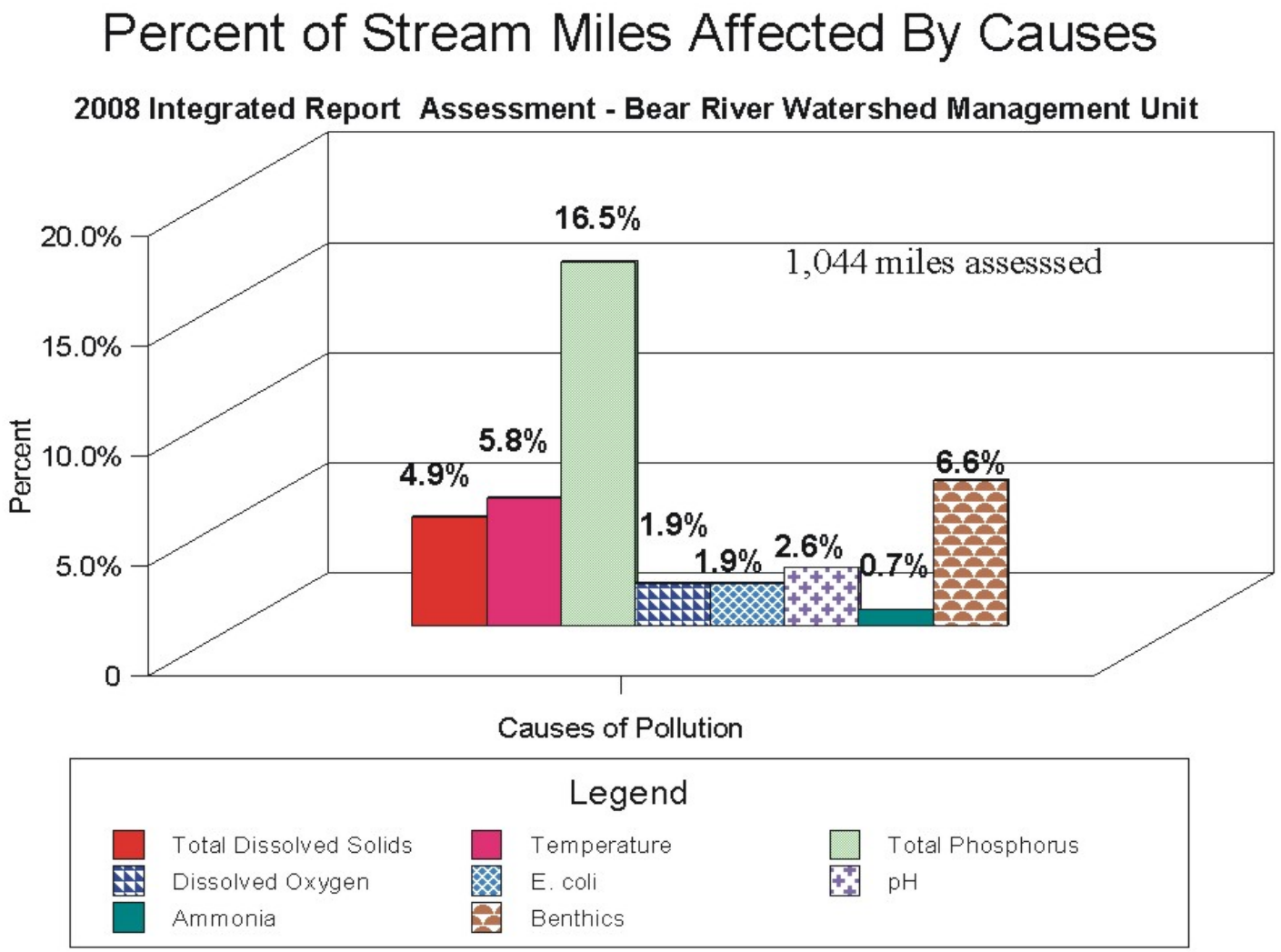

Figure 2.4-4 Percent of assessed stream miles impacted by various causes – Bear River Watershed Assessment Unit

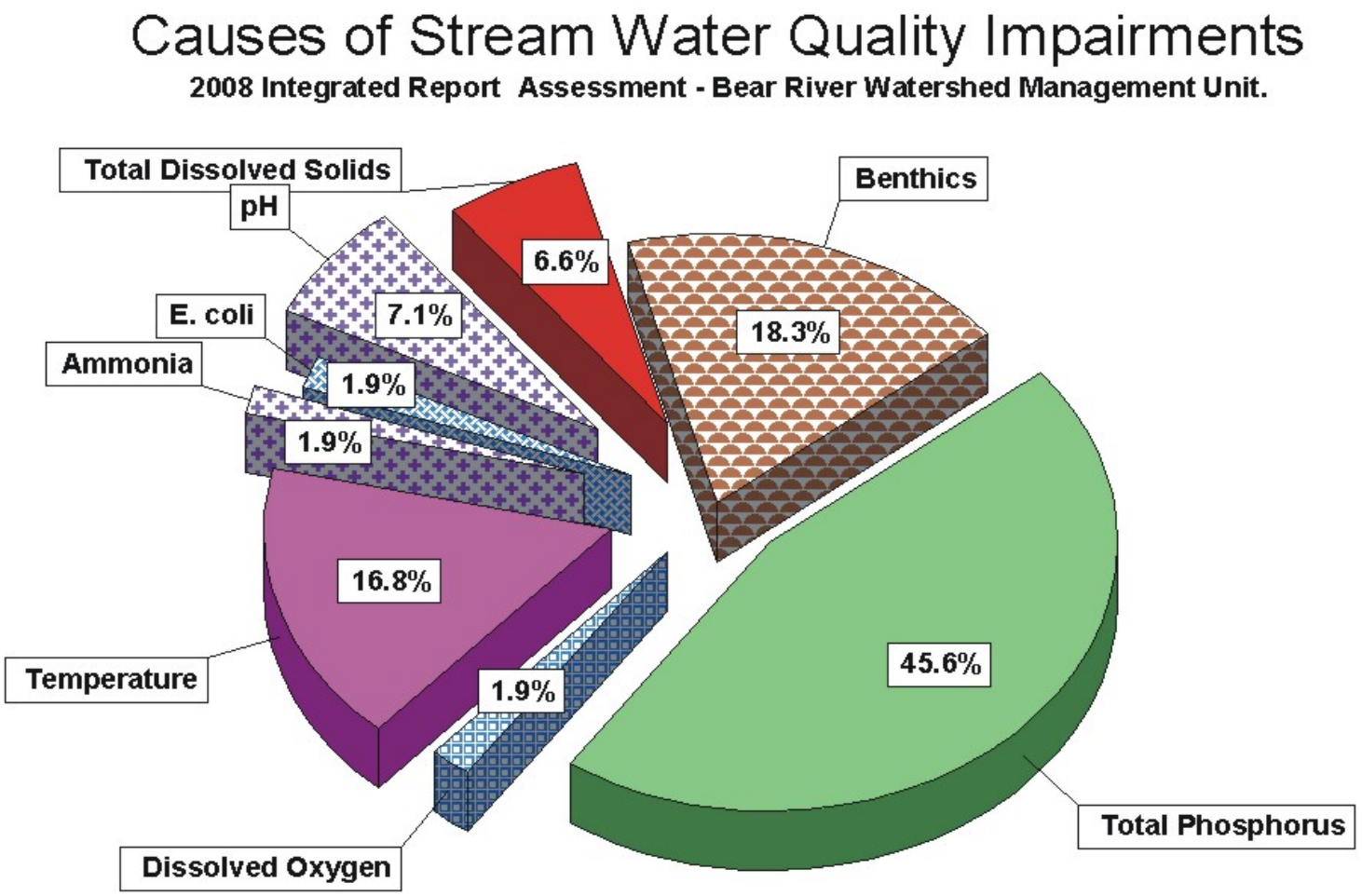

Figure 2.4-5 Relative percent impact by causes on water quality – Bear River Watershed Management Unit

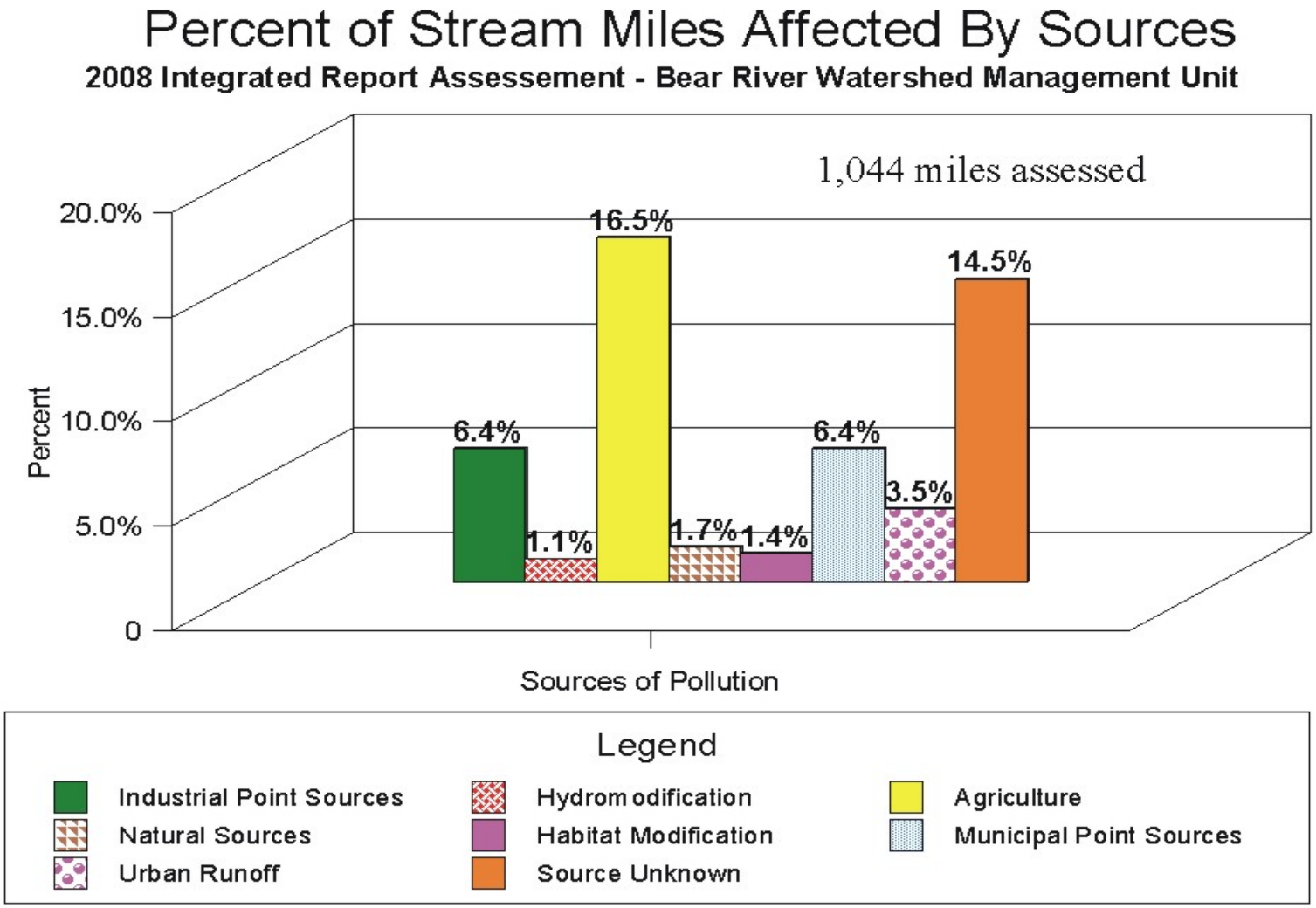

Figure 2.4-6 Percent of stream miles impacted by various sources – Bear River Watershed Management Unit

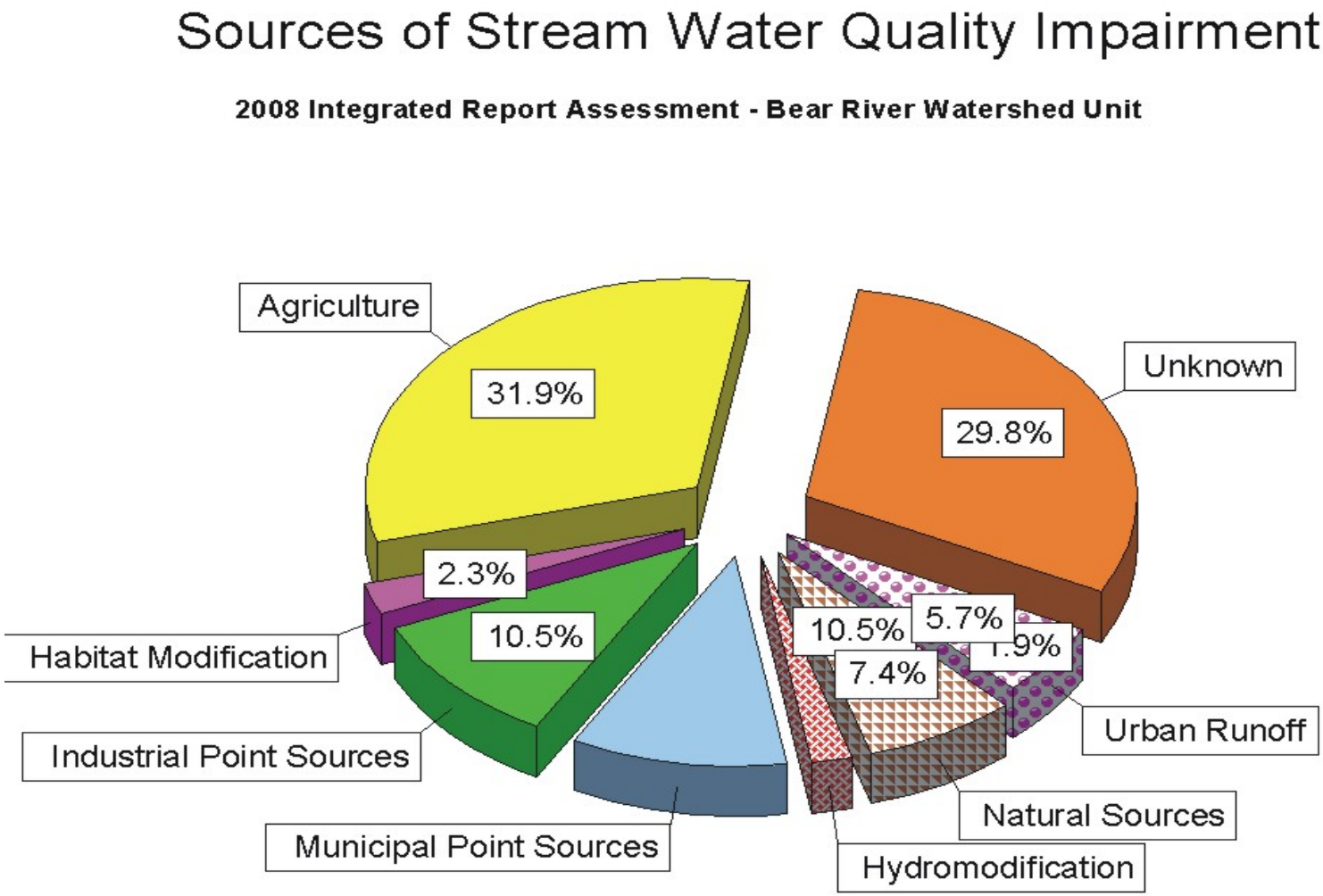

Figure 2.4-7 Relative percent impact by sources on stream water quality – Bear River Watershed Management Unit

Table 2.4-6 Impaired Waters Located in the Bear River Watershed Management Unit

	Assessment Unit ID	Assessment Unit Name	Assessment Unit Description	Beneficial Use Class Impaired	Beneficial Use Support	Support Category	Pollutant Or Pollution	Stream Miles
Bear River	UT16010101-007	Big Creek	Big Creek and tributaries from Bear River to headwaters	2B	NS	5	pH	26.84
Bear River	UT16010101-007	Big Creek	Big Creek and tributaries from Bear River to headwaters	3A	NS	5	pH	26.84
Bear River	UT16010101-007	Big Creek	Big Creek and tributaries from Bear River to headwaters	4	NS	5	pH	26.84
Bear River	UT16010101-028	Yellow Creek	Yellow Creek and tributaries from Utah-Wyoming border to headwaters	3A	NS	5	Benthic macroinvertebrate assessment impairment	16.4
Bear River	UT16010201-002	Laketown	Laketown and Big Creek and other tributaries from Bear Lake to headwaters	3A	NS	5	Temperature	11.5
Bear River	UT16010202-002	Newton Creek	Newton Creek from confluence with Cutler Reservoir to Newton Reservoir	3A	NS	5	Temperature	5.16
Bear River	UT16010202-005	Summit Creek Lower	Summit Creek and tributaries from confluence with Bear River to USFS boundary	3A	NS	5	Temperature	6.8
Bear River	UT16010203-008	Spring Creek	Spring Creek and tributaries from confluence with Little Bear River to headwaters	4	NS	5	TDS	7.36
Bear River	UT16010203-009	Little Bear River-1	Little Bear River from Cutler Reservoir to Hyrum Reservoir	3A	NS	5	Temperature	16.52
Bear River	UT16010203-013	South Fork Little Bear	South Fork Little Bear and tributaries from confluence with Little Bear River to headwaters, except Davenport Creek	3A	NS	5	Temperature	16
Bear River	UT16010204-003	Bear River-1	Bear River from Great Salt Lake to Malad River confluence	4	NS	5	TDS	17.51

	Assessment Unit ID	Assessment Unit Name	Assessment Unit Description	Beneficial Use Class Impaired	Beneficial Use Support	Support Category	Pollutant Or Pollution	Stream Miles
Bear River	UT16010204-006	Malad River-1	Malad River from confluence with Bear River to Utah-Idaho state line	3C	NS	5	Benthic macroinvertebrate assessment impairment	51.96